VARIASI SUHU DAN RASIO (METANOL/MINYAK) TERHADAP KARAKTER BIODIESEL DARI BIJI NYAMPLUNG (*Calophyllum inophyllum* Linn.)

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ABSTRAK

Penelitian bertujuan untuk mengetahui 1) rendemen minyak hasil pengepresan dan biodiesel hasil proses transesterifikasi 2) besarnya massa jenis, viskositas, bilangan asam, kadar air, kalor pembakaran, dan gugus fungsi FTIR biodiesel serta 3) kesesuaian karakteristik biodiesel jika dibandingkan dengan SNI 7182:2015. Tiga tahap sintesis biodiesel yaitu pengepresan, esterifikasi dan proses transesterifikasi menggunakan metanol dan KOH sebagai katalis. Proses transesterifikasi dilakukan pada variasi suhu 45, 55, 65 ^{0}C dan rasio mol (metanol:minyak) 8:1 dan 6:1 selama 60 menit. Pengepresan minyak menghasilkan 27,273 % sedangkan biodiesel hasil transesterifikasi berkisar antara 88,5 sd 94,5%. Karakterisasi biodiesel hasil sintesis memberikan nilai massa jenis biodiesel $B_{B,}$ $B_{D,}$ dan B_E sesuai dengan standar SNI (850–890 kg/m^3), nilai viskositas biodiesel B_E dan B_F sesuai dengan standar SNI (2,3–6,0 cSt), nilai bilangan asam dan kadar air semua biodiesel sesuai dengan SNI 7182:2015, namun untuk nilai kalor pembakaran semua biodiesel belum sesuai. Gugus fungsi biodiesel yang dihasilkan adalah C=O$_{ester}$, C-O$_{ester}$, C-H$_{alkana}$, C-H$_{alifatik}$ dan –CH$_{3.}$

Kata Kunci : Minyak Biji Nyamplung, Transesterifikasi, Karakter Biodiesel

VARIOUS OF TEMPERATURE AND RATIO (METHANOL/OIL) ON BIODIESEL CHARACTER'S FROM NYAMPLUNG SEED (Calophyllum inophyllum Linn.)

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ABSTRACT

The aim of this research are to know 1) yield of oil seed nyamplung from pressing and yield of biodiesel from transesterification process, 2) the value of density, viscosity, acid number, moisture content, heat of combustion and the functional group of biodiesel, 3) the suitability of biodiesel characteristics with SNI 7182:2015. There are 3 steps in biodiesel synthesised there are pressing, esterification and transesterification process using methanol and KOH as catalyst. Transesterification process was performed at variations of temperature 45, 55, 65 ^{0}C and mole ratio of (methanol:oil) are 8:1 and 6:1 for 60 minutes. Oil pressing produces 27.273% while transesterification biodiesel is between 88.5 until 94.5%. The biodiesel characterization of the synthesized product gives the density of biodiesel B_B, B_D, and B_E were suitable with SNI (850-890 kg/m^3), the viscosity of biodiesel B_E and B_F were suitable with SNI (2.3-6.0 cSt), the value of acid number and water content of all biodiesel were suitable with SNI 7182:2015, but for all heat of combustion were not suitable. The functional groups of biodiesel are C=O_{ester}, C-O_{ester}, C-H_{alkane}, C-$H_{aliphatic}$ and -CH_3.

Keywords: Nyamplung Seed Oil, Transesterification, Biodiesel Character